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Soviet Exports of Military Hardware to Eastern Europe

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Foreword

This memorandum updates through 1967 the findings contained in CIA/RR A.ERA 65-4, *A Method of Estimating Soviet Exports of Weapons to Eastern Europe*, December 1965, SECRET.

CENTRAL INTELLIGENCE AGENCY
Directorate of Intelligence
July 1969

INTELLIGENCE MEMORANDUM

Soviet Exports of Military Hardware to Eastern Europe

Summary

In 1967, Soviet shipments of military hardware to the East European countries* totaled an estimated $400 million to $500 million, only about three-fourths of the amount in 1964. The apparent reasons for this decline are two. First, the equipment of East European forces with more modern weapons, begun in 1959, was probably completed by 1964. Second, East European production now satisfies a larger share of the area's requirements for most types of military equipment. Shipments of military hardware to Czechoslovakia probably were cut back after the Soviet invasion of Czechoslovakia in August 1968, but there is no reason to believe that the invasion affected shipments to other East European countries -- except perhaps to Romania, which opposed the Soviet action.

Estimates of Soviet shipments of military hardware to Eastern Europe are calculated from the unitemized residuals in Soviet exports to these

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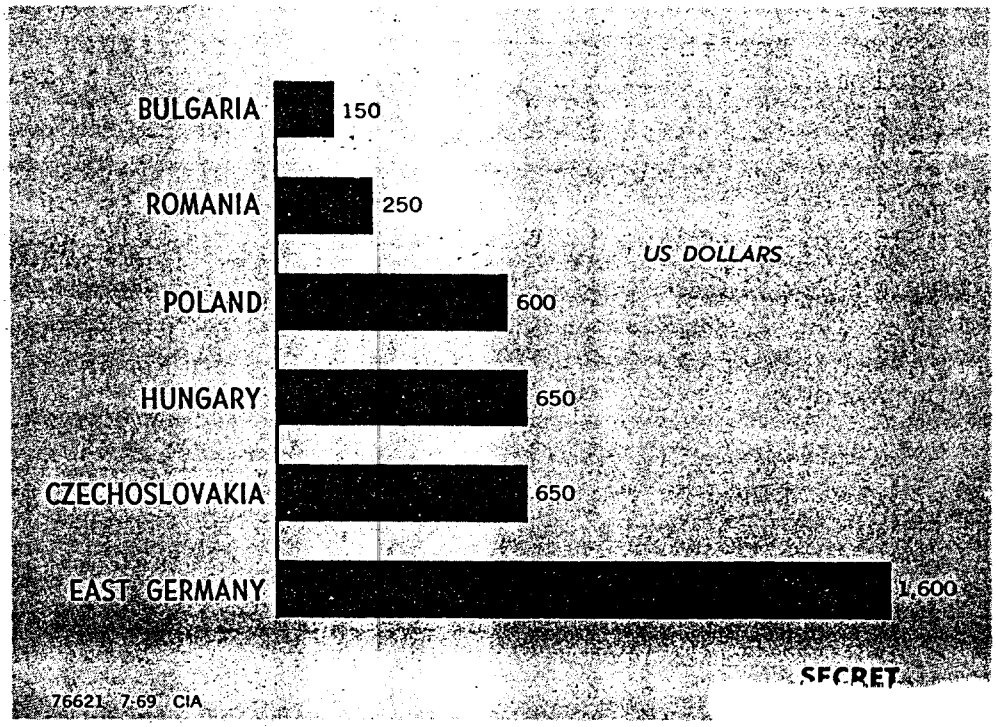
* *This group of countries includes Bulgaria, Czechoslovakia, East Germany, Hungary, Poland, and Romania and is referred to in the remainder of the memorandum as the East European countries or Eastern Europe. Estimates of Soviet shipments of military hardware to Yugoslavia are included in the tables.*

Note: This memorandum was produced solely by CIA. It was prepared by the Office of Economic Research and was coordinated with the Office of Strategic Research.

countries. Analysis of Soviet trade statistics strongly indicates that shipments of military equipment account for the greater part of these unitemized residuals. Research done on East European trade statistics corroborates this conclusion.

Estimated imports of military equipment per man under arms strikingly illustrate the enormous difference between the equipment of the armed forces in the "northern tier" and in the southern countries, especially Bulgaria and Romania. The latter depend largely on imports for basic military equipment, but they import the least relative to the size of their armed forces. (For estimated imports of military hardware per member of the armed forces in 1967, see the chart.) East Germany and Hungary, which produce



considerable military equipment, also import large amounts. East German imports, relative to the size of the armed forces, are the largest in the area, probably because they include both basic and highly sophisticated equipment, and Czechoslovakia and Poland, which are known to produce most of their own basic equipment, nevertheless import substantial amounts per man, probably consisting largely of sophisticated hardware.

Introduction

1. As explained in an earlier research aid (CIA/RR A.ERA 65-4), most of the residual in Soviet reporting of exports to Eastern Europe is believed to represent shipments of military hardware. The method used in that paper to estimate Soviet shipments of military end items to Eastern Europe is still believed to be valid. This method is based on the analysis of official Soviet figures for total exports to East European countries. The analysis leads to the conclusion that the totals include military shipments and that such shipments account for the greater part of the discrepancy, or residual, between the figure for total Soviet exports to a given country and the sum of all exports itemized for that country. If this conclusion is correct, the residual represents an outside limit for the value of military shipments. However, the residual also includes a few nonmilitary items in amounts believed to be small. To obtain the estimates of total military shipments, therefore, amounts equal to a range of 1 to 3 percent of total Soviet exports to each country have been deducted from the respective residuals as an allowance for nonmilitary shipments.

2. Residuals in Soviet exports have generally accounted for at least 10 percent of Soviet exports to the individual East European countries. The earlier research aid concluded that residuals of this size almost certainly could not be accounted for by unlisted goods under ordinary commercial trade. The listing of Soviet exports to East European countries appears to be quite comprehensive. Also supporting the conclusion that the residual in Soviet exports to Eastern Europe contains military hardware is the wide fluctuations in these residuals, both in absolute terms and as a percentage of exports. These fluctuations cannot be attributed to changes in the listing of specific categories. Furthermore, it is highly unlikely that changes in unlisted commercial trade were of a large enough magnitude to explain the fluctuations.

3. As pointed out in the earlier research aid, trade statistics published by Poland, East Germany, and Yugoslavia corroborate the use of the residual in Soviet reporting on exports to these countries to determine Soviet shipments of military equipment. Further research on the trade statistics of the

above-mentioned countries and of Bulgaria, Czechoslovakia, Hungary, and Romania supports, for the most part, the original methodology for determining Soviet exports of military hardware to Eastern Europe. In the case of Poland, however, the estimates of military equipment from the USSR during 1958-60 may be too high. Most of the East European trade data studied were not available at the time of the earlier research aid. Appendix A presents a detailed examination of the import statistics of the East European countries with respect to the identification of military hardware.

Recent Developments in East European Imports of Military Hardware

4. In 1967, Soviet shipments of military hardware to Eastern Europe totaled an estimated $410 million to $512 million (see Table 1). These shipments decreased sharply between 1964 and 1967, following a period of rapid growth which began in 1959. (For an index of estimated Soviet exports of military hardware to Eastern Europe, see the chart.)

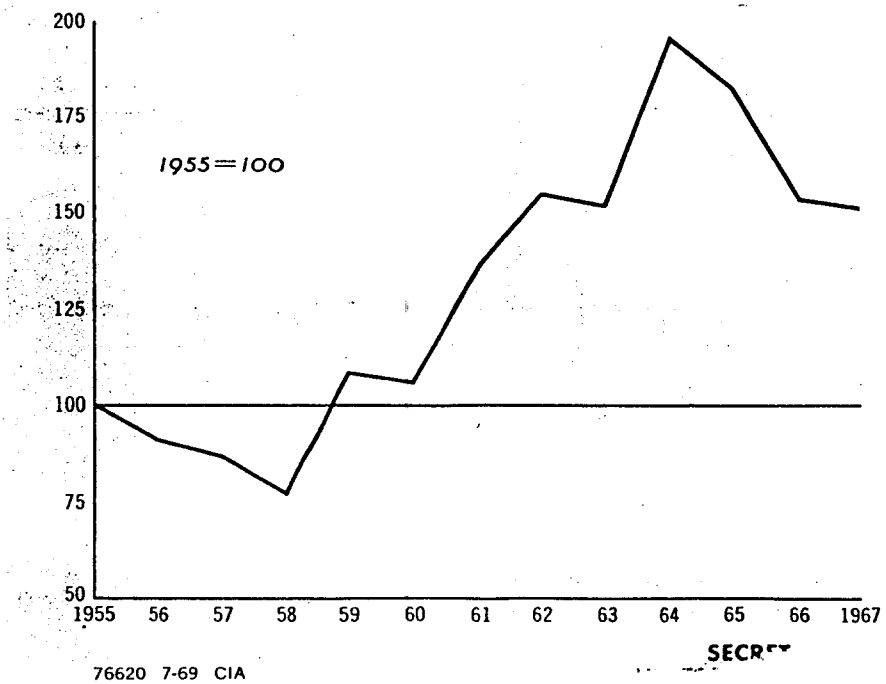


Table 1

Estimated Soviet Exports of Military Hardware to Eastern Europe a/

Million US $

Year	Bulgaria	Czechoslovakia	East Germany	Hungary	Poland	Romania	Total	Yugoslavia
1955	31-34	33-40	56-66	13-16	96-104	58-63	287-323	0
1956	10-12	61-69	55-67	13-15	85-92	37-41	261-296	0
1957	12-15	60-71	93-110	2-7	41-49	32-37	240-289	0-2
1958	26-30	21-30	64-80	2-6	70-77	28-33	211-256	0-1
1959	40-46	62-74	84-104	14-20	84-94	15-19	299-357	0
1960	40-47	73-86	74-95	28-34	72-81	5-10	292-353	3-4
1961	54-62	67-80	91-115	50-57	95-106	24-30	381-450	6-7
1962	60-69	69-85	103-130	68-77	91-103	39-46	430-510	19-20
1963	32-42	70-87	112-138	64-73	94-107	51-59	423-506	23-25
1964	36-47	123-141	131-159	49-59	126-139	84-94	549-639	36-39
1965	19-31	109-127	124-151	61-72	138-153	58-66	509-600	33-36
1966	7-21	86-104	140-168	17-27	140-156	31-39	421-515	52-56
1967	7-22	81-101	122-151	35-47	129-147	36-44	410-512	104-110

a. The estimated ranges were obtained by deducting 1 to 3 percent of Soviet exports from the trade residuals.

Among the possible reasons for the decline during 1965-67 is that by substantially increasing imports during 1959-64 most of the East European countries had built up their stock of advanced military equipment to planned levels and needed to import for the most part only replacements and spare parts. Another possible reason was the greater reliance of the East European countries on the increasing production of military hardware in the area.

5. Enough information on actual deliveries of Soviet military hardware was available for the 1955-64 period to show that the Soviet export residuals roughly followed these deliveries. There has not been enough information on actual deliveries since 1964 to validate the decline in military shipments inferred from the residuals.

6. Soviet shipments of military hardware to Hungary, Czechoslovakia, Romania, and Bulgaria declined sharply between 1964 and 1967. On the other hand, shipments to East Germany declined only slightly and those to Poland rose somewhat. Military hardware as a share of total Soviet exports to Eastern Europe dropped from about 13 percent in 1964 to about 9 percent in 1967. Appendix B contains summary data used in preparing the estimates of Soviet shipments, which were derived from data in the Soviet foreign trade yearbooks.

7. Until the Soviet trade statistics for 1968 are available -- probably late in 1969 -- there will be no direct evidence as to what happened to Soviet shipments of military hardware to Eastern Europe in 1968. However, since the Czech army has been discredited, and even cut back, Soviet shipments of military end items to Czechoslovakia probably have been reduced. The Soviets also may have cut such shipments to Romania because of the latter's opposition to the Soviet invasion of Czechoslovakia. There is no reason to suppose that the invasion had any effect on exports to the other East European countries.

8. In addition to importing military hardware from the USSR the East European countries also trade in military hardware among themselves. Only the largest shippers, Poland and Czechoslovakia, provide detailed enough trade statistics to permit an estimate of their trade in military hardware with

Eastern Europe (see Table 2). In 1967, this totaled an estimated $190 million to $240 million.

Table 2

Polish and Czech Trade in Military Hardware with Eastern Europe a/
1967

Million US $

	Polish Trade b/		Czech Trade c/	
	Exports	Imports	Exports	Imports
Bulgaria	3-4	4	6-7	2-3
Czechoslovakia	37-41	25-30 d/		
East Germany	9-13	20-26	36-42	1-8
Hungary	19-21	16-18	7-10	0-2
Poland			25-30	37-41
Romania	2-3	0-1	2-4	1-3
Total	*70-82*	*65-79*	*76-93*	*41-57*

a. The estimated ranges were obtained by deducting 2 to 4 percent of total exports and imports from the trade residuals.
b. Based on Polish data, unless otherwise indicated.
c. Based on Czechoslovak data.
d. Based on Czechoslovak data. Polish statistics would yield a range of US $39 million to $43 million. The reason for the discrepancy is unknown.

Imports of Military Hardware in Relation to Military Expenditures

9. The northern countries of Eastern Europe have much better equipped armed forces than do the southern countries. Bulgaria and Romania, which produce little military equipment, also import relatively little equipment because of the low

degree of mechanization of their armed forces. Estimated imports of military equipment per man for East Germany are considerably higher than for Poland and Czechoslovakia, as indicated in the following tabulation:

	US $ a/
Bulgaria	150
Czechoslovakia	650
East Germany	1,600
Hungary	650
Poland b/	600
Romania	250

a. Data have been rounded to the nearest 50.
b. In addition, Poland had sizable imports -- an estimated $150 per member of the armed forces -- from East Germany and Hungary.

All three countries have highly mechanized forces, but Poland and Czechoslovakia produce much more of their own equipment than East Germany. The Hungarian armed forces are considerably less mechanized than those of the northern countries but, since Hungary produces little military equipment, it imports about the same amount per man as Poland and Czechoslovakia.

10. What is known of the defense industries in Eastern Europe and of the armament of the East European forces leads to the expectation that imports of military hardware as a share of total military expenditures would be higher for Bulgaria, East Germany, Hungary, and Romania than for Czechoslovakia and Poland. East Germany might be expected to have a very high share because, although it has considerable defense production, its armed forces are armed with some highly sophisticated weapons.

11. A look at the computed shares of imports in military expenditures -- with imports converted into domestic currency at the commercial exchange rate -- gives reasonable results for the most part (see Table 3). It appears, however, that the

relative share of Romania is too low and that of Czechoslovakia is too high. Comparison of imports of military hardware with total military expenditures is difficult. For the purposes of this memorandum, imports have been converted into the domestic currencies of the individual East European countries by using both the commercial and noncommercial exchange rates for the ruble, and military budgets are used as the measure of defense expenditures. What is known of the relative reliance on imports suggests that the ranking is illogical when the noncommercial rate is used.* In actual practice, of course, some of the East European countries may convert imports of military hardware at the commercial rate, whereas others may convert at the noncommercial rate.

12. Another difficulty in comparing imports of military hardware with military expenditures is that the military budgets vary in coverage. Some or all of the countries may omit some defense expenditures from the published budgets. Some of the countries also may exclude part or all of the value of imported equipment from the statistics shown in the budget. In addition, East German and Czech budgeted expenditures on defense are estimated, the former because no reliable figures were available for earlier years and the latter because expenditures on security are included in the published data. It is not known whether the Romanians include expenditures on security forces under budgeted expenditures on defense. If they do, the share of imports in military expenditures may be somewhat higher than shown in Table 3.

* *The noncommercial ruble exchange rate for Bulgaria and East Germany is lower than the commercial rate, whereas it is higher for the other countries.*

Table 3

Estimated East European Imports of Military Hardware from the USSR as a Percentage of Announced East European Military Expenditures a/
Annual Averages, 1958-62 and 1963-67

Percent

	Using the Exchange Rate for			
	Commercial Transactions		Noncommercial Transactions	
	1958-62	1963-67	1958-62	1963-67
Bulgaria	28	12	17	7
Czechoslovakia	6	9	8	11
East Germany	13	15	9	10
Hungary	13	10	13	10
Poland	2	2	8	8
Romania	4	7	5	9

a. Imports were converted into domestic currencies using the official commercial and noncommercial exchange rates for the ruble. East German and Czech data on military expenditures are estimated. The Czech statistics have been reduced to obtain an estimate excluding expenditures on security. The East Germans have only published realistic data on budget allocations to defense since 1962. These data include expenditures on personnel and most military hardware. The earlier series of estimates made by this Office have been continued and extended to the present, however, because they are believed to be more complete than the official East German statistics.

APPENDIX A

Statistical Evidence from the Import Statistics of Soviet Trade Partners

The East European countries vary in their handling of imports of military hardware from the USSR. East Germany -- at least through 1965 -- and Yugoslavia have excluded these imports altogether from their trade data. Bulgaria, Hungary, Poland, and Romania apparently include receipts of military end items under imports of machinery and equipment. Czechoslovakia apparently did also until 1967, when such imports appear to have been switched to the metals category.

East Germany and Yugoslavia

CIA/RR A.ERA 65-4 concluded that the differences in East German and Yugoslav imports from the USSR as reported by these countries and as reported by the USSR were of the same general order of magnitude as the estimated Soviet exports of military hardware based on the residual method. This, then, served as further corroboration of the use of the residual method. A comparison of East German and Soviet reporting on total Soviet exports to East Germany in 1966 and 1967 indicates, however, that the East Germans now include imports of military hardware in their reporting. In those two years the difference between the two sets of reporting averaged only $10 million a year, whereas the estimates of Soviet shipments of military hardware to East Germany averaged $131 million to $160 million. The Yugoslavs apparently still exclude these shipments from their reporting.

Poland

Research done since the referenced research aid was completed supports, for the most part, the original methodology for determining Soviet exports of military hardware to Eastern Europe. Further study of Polish trade data indicates that the estimates of imports of military end items from the USSR are too high for 1958-60* but are of the right order

* *Itemized Polish reporting on foreign trade did not begin until 1958.*

of magnitude for 1961-67. This conclusion is based on an examination of the residual in Polish reporting on imports of machinery and equipment from all sources and on the difference between Polish and Soviet reporting on deliveries to Poland during 1964-67 of machinery and equipment from the USSR.

Analysis of Polish trade data indicates that the Poles include practically all imports of military end items under the total given for machinery and equipment imports. The unitemized residual in Polish reporting on total imports of machinery and equipment has been sizable, ranging between 18 and 34 percent of total imports of machinery and equipment. In 1960, for example, Polish imports of machinery and equipment amounted to $405 million and the unitemized residual totaled $72 million, which should be the upper limit on imports of military end items from all sources and should include as well a reasonable residual for unitemized machinery other than military end items. According to the estimates based on Soviet reporting, the USSR alone accounted for $72 million to $81 million of shipments of military end items to Poland in that year. A comparison of the data for the years 1958-59 gives similar results. For 1961 and later years, on the other hand, the residual on Polish machinery imports is considerably higher than the range of estimates derived from the unitemized residual in total Soviet exports to Poland. In 1963, for example, total imports of machinery and equipment were $674 million and the residual came to $154 million, which is large enough to include estimated imports of machinery end items from the USSR ($94 million to $107 million) and from other East European countries ($32 million to $44 million*) as well as a reasonable unexplained residual.

The belief that the estimates for the years after 1960 are of the right order of magnitude is borne out by a comparison of Polish figures on total imports during 1964-67 of machinery and equipment from the USSR** with Soviet figures on total exports

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* *See CIA/RR A.ERA 65-4, p. 4.*

** *These figures are new. Previously the Poles have given imports of machinery and equipment from the USSR only by individual items and have given no total for such imports.*

of machinery and equipment to Poland. The differences are close to previous estimates of Soviet shipments of military end items, as shown in the following tabulation.

Million US $

	1964	1965	1966	1967
Polish reporting on total imports of machinery and equipment from the USSR	229	260	294	327
Soviet reporting on total exports of machinery and equipment to Poland	98	109	144	170
Difference	131	151	150	157
Estimates of Soviet shipments of military end items to Poland a/	126-139	138-153	140-156	129-147

a. Based on the method of subtracting from the residual in Soviet reporting 1 to 3 percent of total Soviet exports.

Another discrepancy between Polish and Soviet reporting on Soviet exports to Poland cannot be explained on the basis of information now available. During 1955-65, Soviet reporting showed larger total exports to Poland than did Polish reporting -- about $33 million a year on the average. In 1955 the difference was $118 million, which indicates that perhaps in that year the Poles did not include imports of military hardware -- which totaled an estimated $96 million to $104 million from the Soviet Union -- in their reporting. In 1953-54 the difference was also very large and presumably could have covered imports of military hardware. In every year after 1955 the difference was too low to allow the conclusion that the Poles excluded all imports of military hardware, but they may have excluded certain categories of such imports. If so, the estimates based on the Soviet residual for 1958-61 may not be too high. Otherwise, the difference cannot be fully explained. A small part results from different

reporting of individual commodities. For example, Poland reports considerably smaller imports of nonferrous metals and coal than the USSR reports as exports. Soviet and Polish reporting on Soviet imports from Poland during 1955-65 are in fairly close agreement.

Czechoslovakia

The difference between Czech and Soviet data on total Czech imports of machinery and equipment from the USSR in 1955, 1960, and 1965 -- the only years for which these figures are available (see the following tabulation) -- also supports the use of the 1-to-3 percent allowance.

	Million US $		
	1955	1960	1965
Czech reporting on total imports of machinery and equipment from the USSR	77	139	267
Soviet reporting on total exports of machinery and equipment to Czechoslovakia	37	60	131
Difference	40	79	136
Estimates of Soviet shipments of military end items to Czechoslovakia a/	33-40	73-86	109-127

a. Based on the method of subtracting from the residual in Soviet reporting 1 to 3 percent of total Soviet exports.

It appears that in 1967 the Czechs switched their imports of military hardware from the USSR to the metal ores and metal products category. Czech reporting gave a figure of $122 million higher than Soviet reporting for this category. In 1966 this difference was only $26 million. The Soviet figures are taken from itemized data but probably include most exports under this category. Estimated Czech imports of military hardware from the

USSR in 1967 were $81 million to $101 million, values that could easily be included in the unexplained difference in the metals category.

Romania

Romanian data on total imports of machinery and equipment appear to include military hardware. The Romanians do not break out such imports by country. The reporting of partner countries on exports of machinery and equipment to Romania adds up to less than total Romanian imports of machinery and equipment. In 1967, for example, imports of machinery and equipment from the USSR, Czechoslovakia and Poland,* Hungary, and non-Communist countries accounted for less than four-fifths of total imports of machinery and equipment. Imports of machinery and equipment from other Communist countries could have accounted for only about another one-twelfth. Thus about one-seventh -- or some $108 million worth -- of Romanian imports of machinery and equipment are not accounted for. These probably include imports of military hardware, which amounted to an estimated minimum of $40 million to $51 million in 1967.

Bulgaria

Bulgaria apparently also includes imports of military equipment under the machinery and equipment category. In 1967 the difference between total imports of machinery and equipment, as reported by the Bulgarians, and imports by country, as reported by the partners, was an estimated $63 million to $92 million.** Bulgarian imports of military hardware from the USSR, Poland, and Czechoslovakia came to an estimated $16 million to $33 million.

Hungary

The use of the Soviet residual in estimating exports of military hardware is further substantiated

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* *Imports of machinery and equipment from Czechoslovakia and Poland were calculated from itemized data. Total imports may have been somewhat -- probably not much -- higher. Imports from non-Communist countries include imports from Yugoslavia.*

** *Bulgarian imports of machinery and equipment from East Germany and Romania were estimated.*

by Hungarian trade data. The residual in Hungarian imports of machinery and equipment from Communist countries generally has been more than enough to include imports of military hardware. In 1966, for example, Hungarian imports of machinery and equipment from the USSR, Czechoslovakia, and Poland -- as reported by these countries -- accounted for 57 percent of such imports from Communist countries. Other Communist countries provided an estimated 24 to 35 percent of these imports, leaving a residual of $30 million to $56 million. Estimated Soviet shipments of military hardware to Hungary in 1966 totaled $17 million to $27 million. Similar results were obtained using the same type of data for 1964.

The estimate of $61 million to $72 million for Soviet shipments of military hardware to Hungary in 1965 appears, however, to be too high. Hungarian reporting on total imports of machinery and equipment from the USSR in 1965 -- the only year for which this information is available -- gives a figure of only $55 million higher than does Soviet reporting.

APPENDIX B

Residuals in Soviet Exports to Eastern Europe and Yugoslavia

	Unit	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
Bulgaria														
Total exports	Million US $	127.4	108.4	172.4	200.6	289.9	329.0	356.2	447.8	495.4	567.4	588.4	697.1	761.9
Residual	Million US $	35.0	12.8	17.2	32.0	49.1	50.0	65.1	73.0	46.8	52.6	36.8	27.7	29.8
Residual	Percent of total exports	27.5	11.8	10.0	16.0	16.9	15.2	18.3	16.3	9.4	9.3	6.3	4.0	3.9
Czechoslovakia														
Total exports	Million US $	355.9	373.7	551.3	446.8	603.0	630.8	652.7	770.7	849.0	900.8	925.9	894.0	967.4
Residual	Million US $	43.9	72.5	77.0	34.6	80.0	92.1	86.9	92.4	95.1	149.8	136.4	113.1	110.3
Residual	Percent of total exports	12.3	19.4	14.0	7.7	13.3	14.6	13.3	12.0	11.2	16.6	14.7	12.7	11.4
East Germany														
Total exports	Million US $	478.7	571.3	862.1	799.8	1,030.1	1,051.7	1,209.1	1,372.7	1,313.9	1,385.2	1,363.0	1,406.8	1,415.9
Residual	Million US $	70.5	72.5	118.7	87.6	114.7	105.4	127.5	144.2	151.1	172.8	164.8	182.4	164.8
Residual	Percent of total exports	14.7	12.7	13.8	11.0	11.1	10.0	10.5	10.5	11.5	12.5	12.1	13.0	11.6
Hungary														
Total exports	Million US $	115.3	126.9	249.7	200.6	259.8	311.4	359.3	411.1	443.4	492.7	545.9	504.6	585.5
Residual	Million US $	16.9	16.6	9.3	8.3	22.1	37.0	60.8	80.8	77.4	63.6	77.0	32.2	52.7
Residual	Percent of total exports	14.7	13.1	3.7	4.1	8.5	11.9	16.9	19.7	17.5	12.9	14.1	6.4	9.0

	Unit	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
Poland														
Total exports	Million US $	431.8	357.2	430.9	376.8	486.4	490.8	530.7	594.1	662.5	660.0	726.7	803.2	912.1
Residual	Million US $	108.8	95.8	53.7	81.1	98.5	86.3	111.4	108.5	113.4	145.4	159.9	163.6	156.2
Residual	Percent of total exports	25.2	26.8	12.5	21.5	20.3	17.6	21.0	18.3	17.1	22.0	22.0	20.4	17.1
Romania														
Total exports	Million US $	267.8	212.0	250.8	251.3	232.4	260.7	291.8	374.8	399.0	493.1	402.8	386.3	394.6
Residual	Million US $	65.6	43.3	39.1	35.4	21.8	12.5	32.7	50.1	63.3	99.2	70.3	42.9	47.8
Residual	Percent of total exports	24.5	20.4	15.6	14.1	9.4	4.8	11.2	13.4	15.9	20.1	17.5	11.1	12.1
Total														
Total exports	Million US $	1,776.9	1,749.5	2,517.2	2,275.9	2,901.6	3,074.4	3,399.8	3,971.2	4,163.2	4,499.2	4,552.7	4,692.0	5,037.4
Residual	Million US $	340.7	313.5	315.0	279.0	386.2	383.3	484.4	549.0	547.1	683.4	645.2	561.9	561.6
Residual	Percent of total exports	19.2	17.9	12.5	12.3	15.3	12.5	14.2	13.8	13.1	15.2	14.2	12.0	11.1
Yugoslavia														
Total exports	Million US $	16.4	69.1	73.1	51.1	46.2	55.1	35.9	72.3	96.3	134.9	145.1	213.9	280.3
Residual	Million US $	0.5	0.4	2.4	1.1	0.8	4.3	7.4	21.0	25.6	40.1	37.8	58.3	112.4
Residual	Percent of total exports	3.0	0.6	3.3	2.2	1.7	7.8	20.6	29.0	26.6	29.7	26.1	27.3	40.1